



Caring for the Elderly at Work and Home: Can a Randomized Organizational Intervention Improve Psychological Health?

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Abstract

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Although job stress models suggest that changing the work social environment to increase job resources improves psychological health, many intervention studies have weak designs and overlook influences of family caregiving demands. We tested the effects of an organizational intervention designed to increase supervisor social support for work and nonwork roles, and job control in a results-oriented work environment on the stress and psychological distress of health care employees who care for the elderly, while simultaneously considering their own family caregiving responsibilities. Using a group-randomized organizational field trial with an intent-to-treat design, 420 caregivers in 15 intervention extended-care nursing facilities were compared with 511 caregivers in 15 control facilities at four measurement times: pre-intervention, six, twelve, and eighteen months. There were no main intervention effects showing improvements in stress and psychological distress when comparing intervention with control sites. Moderation analyses indicate that the intervention was more effective in reducing stress and psychological distress for caregivers who were also caring for other family members off the job (those with elders and those “sandwiched” with both child and elder caregiving responsibilities) compared to employees without caregiving demands. These findings extend previous studies by showing that the effect of organizational interventions designed to increase job resources in order to improve psychological health varies according to differences in nonwork caregiving demands. This research suggests that caregivers, especially those with “double-duty” elder caregiving at home and work and “triple-duty” responsibilities, including child care, may benefit from interventions designed to increase work-nonwork social support and job control.

Keywords

job stress; elder care; organizational intervention; work-family; health care

Interest is growing in organizational stress interventions designed to create psychologically healthy work environments (Anger, Elliott, Bodner, Olson, Rohlmon, Truxillo, et al., 2015) by increasing job resources of support and control to improve employee well-being (Hammer, Saksvik, Nytrø, Torvatn, & Bayazit, 2004; Murta, Sanderson, & Oldenburg, 2007; Nielsen, Randall, Holten, & Gonzalez, 2010). Yet studies often have weak designs, a positive bias, or lack a true control group (Biron, Cooper, & Gibbs, 2011; Biron, Karinka-Murray, & Cooper, 2011; Richardson & Rothstein, 2008; Semmer, 2006). Relatively few organizational intervention studies use group-randomized assignment, measure the sustainability of effects over time, or use rigorous “intent to treat” analysis, which is referred to as “once randomized, always analyzed” (Gupta, 2011, p. 1). These are critical gaps, as they limit our ability to make causal inferences on the intervention efficacy (Noblet & LaMontagne, 2008). Workplace intervention studies also overlook influences of employees’ nonwork caregiving demands (c.f., Bono, Glomb, Shen, Kim, Koch, 2013; Clauss, Hoppe, O’Shea, González Morales, Steidle, & Michel, 2016), which are highly relevant to occupations at risk for high strain and with similar task demands. In particular, professional health care workers (often female), may face fatigue from caring for the elderly while simultaneously caring for family members off the job (Ward-Griffin, St-Amont, & Brown, 2011).

The goal of this study is to use a group-randomized field trial and intent-to-treat approach to test whether an organizational intervention designed to increase (1) job resources of social support for work and family roles, and (2) job control in a results-oriented work environment reduced perceived stress and psychological distress of employees over time. We focused on these dependent variables as they capture theoretically related aspects of psychological health, allowing for a nuanced comparison of intervention effectiveness, and are often targets of job stress interventions. Perceived stress is an appraisal of the degree to which a demanding situation cannot be controlled; or is unpredictable and overloaded, such as evaluating the stressfulness of the job and captures the perception dimension of stress (Cohen & Williamson, 1988). Psychological distress is a measure of depressive symptoms often used to clinically screen for mental health (Kessler, Andrews, Colpe, Hiripi, Mroczek, Normand, et al., 2002). Psychological distress is the “long term” response to perceived stress, or demanding situations, which takes a toll on psychological health when coping resources are not mobilized.

A second objective of this study was to determine whether subgroups of caregivers with additional nonwork caregiving demands (child care, elder care, and “sandwiched” employees responsible for both child care and elder caregiving) experience greater benefits (i.e., greater reduction in perceived stress and psychological distress) with these changes in working conditions, compared to workers without these family care obligations. We focused on caregiving demands, as studies have shown that varying family structures (e.g. being a single or married parent) have differential exposure to stressors (Avison, Ali, & Waters, 2007). We examined extended-care nursing facilities, which predominately have a female workforce with many dual-earner and single parents in demanding low and middle-income jobs. Many health care employees provide double-duty care (performing elder care roles at work, and family elder or child care roles when off the job) or triple-duty care if they have sandwiched nonwork care demands (both children and elders) (DePasquale, Davis, Zarit, Moen, Hammer, & Almeida, 2016; Ward-Griffin et al., 2011). Employees in health care experience competing stressors such as having jobs with high emotional labor from handling patient pain and sometimes life and death demands, which are enacted in challenging regulatory contexts with 24-7 care coverage requirements (Kossek, Piszczek, McAlpine, Hammer, & Burke, 2016). Employees in these occupations may be at increased risk for psychological health issues, and are a workforce segment of critical importance. The demand for paid assisted living services and nursing care will more than double between 2010 and 2040 in the U.S. and globally (Cameron & Moss, 2007; Johnson, Toohey, & Weiner, 2007). Recent studies on health care workers (Bono et al., 2013) and elder caregivers (Clauss, et al., 2016) examined individual-level positive cognitive work reflection interventions, which lacked a randomized control design, evaluated the intervention for a relatively shorter time period (i.e., 3–5 weeks), did not focus on changing the work context, or examined the influence of caregiving demands. Research is needed on how caregivers, and health care workers in general, can benefit from organizational interventions designed to improve psychological health.

This paper contributes to the relatively unintegrated literatures on organizational stress interventions, work and family care responsibilities, and employed elder caregivers. It uses a rigorous research design to clarify main and subgroup effects for a workforce that is

important to society. By using four waves of data over eighteen months, we examined when changes due to the intervention occurred, and their sustainability (Anger et al., 2015; Biron et al., 2011). Though under-utilized in organizational occupational health research, we add to knowledge by using an “intent-to-treat” approach, where all employees originally assigned to the intervention are included in the analysis (Fisher, Dixon, Herson, Frankowski, Hearron, Peace, 1990; Gupta, 2011). This design avoids the sample bias problem of simply removing participants if they drop out, or are not fully compliant after assignment to the intervention. It is an approach relevant to job stress intervention studies, since many interventions are adopted and mainstreamed at the organizational level across worksites. Our study seeks to synthesize main and moderating effects for evaluating organizational interventions to increase psychological health. We hope to contribute to knowledge by examining whether the effectiveness of organizational interventions designed to increase job resources of support and control on the well-being of individuals in care work occupations may be a function of different types of family elder and child caregiving demands (Kossek, Colquitt & Noe, 2001). We seek to examine whether occupational demands and family/personal life demands are increasingly important to jointly measure in designing occupational health initiatives. In the following sections, we (1) discuss our main dependent variables of interest; (2) provide empirical background on intervention development; and (3) introduce our model and discuss how Job Demands-Resources (JD-R) theory links to our hypotheses.

Perceived Stress and Psychological Distress: A Growing Occupational Health Concern

Growing evidence suggests that the work social context is a contributor to individuals’ psychological health (Blustein, 2008; Hammer et al., 2004). Levels of perceived stress and psychological distress – two key facets of psychological health – are rising for nearly every demographic employee group spanning high to low income countries around the globe, harming employers, individuals, families, and societies (ILO, 2011). While there are multiple dimensions of psychological health, occupational health research often conceptualizes it in terms of perceived stress – or an individual’s perceptions of, and response to, environmental demands (e.g., life events, individual differences, environmental conditions) that he/she feels exceed his/her capacity (Cohen, Kamarck, & Mermelstein, 1983; Griffin & Clarke, 2011; Lazarus & Folkman, 1984). Stress is a specific measure of psychological turmoil and challenges due to life circumstances (Cohen, et al., 1983). It measures a gap between an individual’s appraisal of available resources and demands and the degree to which one’s obligations and needs are outstripping these resources so that life feels uncontrollable or overwhelming (Cohen & Williamson, 1988). Perceived stress is a common experience, especially among nurses, and is related to decreased job performance and physical health (AbuAlRub, 2004; Ganster & Rosen, 2013).

Psychological health can also be measured in terms of more severe impairment such as psychological distress, which is a global indicator of psychological problems and mental health; and assessed via questions about anxiety and depressive symptoms (Almeida & Wong, 2009; Kessler et al., 2002; Pearlin, 2010). For example, psychological distress

reflects specific cognitive, behavioral, emotional, and psychophysiological symptoms that are related to a wide range of mental disorders (Kessler et al., 2002), including anxiety (Veit & Weir, 1983) and depressive symptoms – the latter being one of the main causes of work-related disability worldwide (Kessler et al., 2002). Growing life tensions are increasing levels of stress and psychological distress, which are linked to physical health (Allen & Armstrong, 2006), short sleep duration (Berkman, Liu, Hammer, Moen, Klein, et al., 2015; Crain, Hammer, Bodner, Kossek, Moen, et al., 2014), and work productivity such as job satisfaction, absenteeism, and workers' compensation incidents (Parks & Steelman, 2008; Richardson & Rothstein, 2008). Stress and psychological distress also have been linked to backache, headache, eyestrain, sleep issues, dizziness, fatigue, loss of appetite, and gastrointestinal problems (Nixon et al., 2011). Research has also found that training supervisors to be more aware and sensitive to mental health issues in the workplace leads to improved worker and workplace outcomes such as decreased workers compensation claims (Dimoff, Kelloway, & Burnstein, 2016). Therefore, in order to obtain a more in-depth examination of organizational initiatives and their impact on psychological health, the present study utilizes measures to assess less severe (perceived stress) and more severe (psychological distress) impairments to employee psychological health as outcomes associated with an intervention aimed at increasing supervisor social support and improving workers' control over their work.

Intervention Development Background

Scholars have identified a need for theoretically-based and methodologically strong studies evaluating the effectiveness of psychosocial interventions (Hammer, Demsky, Kossek, & Bray, 2015; Hammer & Sauter, 2013). The lack of rigorous designs makes it challenging to support causal arguments on how to change organizations to improve well-being. It is possible that inconsistent research results are due to systematic within and between group variance in organizational adoption of the initiatives, since multi-level research is limited.

Addressing these gaps identified in previous studies, the Work Family and Health Network (WFHN) was created through a cooperative agreement between the U.S. National Institutes of Health and the Centers for Disease Control and Prevention. The WFHN brought together a national U.S. interdisciplinary team of researchers to develop and evaluate an organizational intervention to improve health and well-being of workers. The research team conducted research in two phases to develop a theoretically-based intervention that incorporated principles of organizing work to increase support and control to foster healthy employees and families (King, Karuntzos, Casper, Moen, Davis, Berkman, 2012). In Phase I, the WFHN piloted two intervention components and in Phase II, it combined these components to create a multi-faceted intervention to evaluate in a group randomized control trial (RCT) (Bray, Kelly, Hammer, Almeida, Dearing, King, et al., 2013; King et al., 2012).

In the piloting phase, separate studies were conducted on two different intervention components in two occupational contexts: (1) training grocery store supervisors to engage in family supportive behaviors (FSSB) for hourly workers (Hammer, Kossek, Anger, Bodner, & Zimmerman, 2011); and (2) a change initiative called Results Only Work Environment (ROWE), which included facilitator-led participatory training aimed at increasing

professional employees' control over work schedules and reducing low value work such as attending unproductive meetings, or decreasing negative comments (called "sludge") regarding face time with co-workers at a major U.S. Fortune 500 corporate headquarters (Kelly, Moen, & Tranby, 2011). These interventions are referred to respectively as FSSB training and ROWE. Using a randomized design, the initial FSSB study showed that there was a main effect on physical health between control and treatment sites from training supervisors. There were also moderation effects: grocery retail employees who had higher levels of work-family conflict prior to the intervention and were in stores where supervisors were exposed to the intervention reported higher well-being and physical health compared to the control sites (Hammer, et al. 2011). Regarding the ROWE initiative, using a naturally occurring quasi-experimental design, Kelly and colleagues (2011) found that professionals participating in work units adopting ROWE reported improved health behaviors and well-being.

Turning to Phase II, these two main intervention components (FSSB training and ROWE) were integrated to develop a comprehensive intervention called STAR. STAR is theoretically designed to increase contextual resources of support and control in the work social environment to foster well-being (Kossek, Hammer, Kelly, & Moen, 2014). Two large-scale data collection efforts to evaluate the STAR intervention were conducted in two industries: one with information technology professionals and the other with long-term health care employees. (More information on STAR is in the Method section).

The Kelly and colleagues (2014) study of IT professionals found that in the first 12 months, employees whose worksites implemented STAR reported increased control over work time, an increase in experienced family supportive supervisor behaviors (FSSB), and enhanced health such as sleep quality. Moen and colleagues (2016) found that STAR reduced stress and psychological distress for employees who had higher levels of stress and psychological stress at baseline, and especially women, among the IT sample. Moen and team also found that these effects were partly mediated by declines in schedule control and burnout at six months. However, whether STAR could improve the stress and psychological distress of employees in a lower occupational status such as long-term care remains unexplored. Such less-privileged employees might face not only different emotional and physical job demands, but additional stressors associated with lower income such as financial or family instability that might derail the organizational change (Moen, Kelly, Fan, Lee, Almeida, et al., 2016).

The current study uses Phase II WFHN data to extend and address these important previously unexplored issues on STAR intervention effectiveness. It examines main effects and caregiving moderating intervention effects on stress and psychological distress for long-term care nursing employees over an 18-month period. Figure 1 shows a model of these relationships examined in this study. As we explain below via JD-R theory (Bakker & Demerouti, 2016; 2007), the STAR intervention is designed to increase employees' resources that should reduce perceived stress and psychological distress (Hypothesis 1). We further explore the impact of these resources by considering how family demands related to caregiving influence these relationships (Hypothesis 2, Research Questions 1 and 2). The current study not only addresses whether STAR can enhance subjective well-being for health care workers, but also addresses research questions that were previously unaddressed in the

first network publication of STAR on the health care workers by Hammer and colleagues (2015). Using three data waves collected over 12 months, they found significant effects of STAR in buffering declines in safety compliance and organizational citizenship behaviors for experimental compared to control sites. The current study makes significant contributions distinctive from the 2015 publication. First, it uses 18 months of data on unique dependent variables (stress, psychological distress), which are important indicators of psychological health and well-being. Second, since it was collected over four waves, (baseline, 6 month, 12 month and 18 month), this longitudinal period enables examination of the lingering, lagged and sustainability effects of the intervention, which many studies do not do. Third, it examines the effects of family care moderating variables (often overlooked) on these outcomes. Overall, it advances theory and offers new analysis related to: (1) the effects of STAR on the psychological health among the long-term healthcare employees; and (2) the moderating effects of caregiving demands on intervention linkages to well-being.

Theory and Hypotheses: Job Demands-Resources Interventions

We integrate different perspectives for understanding the effectiveness of psychosocial interventions (Biron et. al, 2011) with the JD-R theory (Bakker & Demerouti, 2016; 2007) and examine moderators of intervention effectiveness related to caregiving responsibilities (Hammer et al., 2011). From a human resources perspective, the JD-R focuses on “positive” motivational processes related to increasing employee motivation and performance, and from an occupational health perspective the JD-R primarily focuses on the “negative” stress perspective aimed at reducing occupational hazards and increasing employee well-being (Schaufeli & Taris, 2014, p. 59). Organizations employ different strategies including training programs, job redesign, culture change initiatives, and strength-based interventions aimed at allowing employees to unlock and use their strengths (e.g., resilience) on the job (Bakker & Demerouti, 2016; Bakker, Demerouti, & Sanz-Vergel, 2014; Holman & Axtell, 2016; Schaufeli & Taris, 2014). Interventions based on the JD-R theory aim to: (1) optimize job demands, (2) increase job resources, and/or (3) foster personal resources (Bakker, et al., 2014).

Linking to the JD-R perspective, STAR is a theoretically designed organization-level intervention aimed at increasing job resources and fostering personal resources to improve employees’ well-being. Job control over work and social support are work resources that can foster healthy workplaces (Karasek & Theorell, 1990). Given that STAR was designed to enhance supervisor support for family, personal life and job roles, and job control, we contend that it should create resources to buffer the existing demands of long-term health care workers. These workers face the challenging job conditions of caring for elderly individuals who may be ill, dying, or facing death. Such jobs can impose heavy demands, which are harmful to well-being and have predicted stress and psychological distress in nursing populations. Yet little research has been done using randomized interventions designed to affect well-being indicators in this context (Gelsma, van der Doerf, Maes, Akerboom, & Verhoeven, 2005).

Beyond increasing job resources, STAR is also designed to help foster personal resources (Bakker, et al., 2014). Supervisor support for family and personal life, job roles, and control

over job tasks can enhance perceptions of individual resources related to psychological capital, energy, and the ability to handle time and job pressures. These personal resources should further enhance psychological health, reducing feelings of stress and psychological distress caused by existing demands (Biron, Karinka-Murray, & Cooper, 2011; ten Brummelhuis & Bakker, 2012). Therefore, we hypothesize:

Hypothesis 1: Compared to worksites randomized to the control group, employees in facilities randomized to the organizational intervention will report improved psychological health, specifically lower (a) perceived stress and (b) psychological distress.

Baseline Moderators: Resources in the Context of Multiple Demands

Despite the theoretical support for the general benefits of adopting organizational psychosocial interventions in the job stress literature (Anger et al., 2015), closer examination of individual-level findings may tell an alternative story. The JD-R literature recognizes the buffering role that resources play in the context of job demands (e.g., Bakker & Demerouti, 2016; Bakker, Demerouti, & Euwema, 2005; Dicke, Stebner, Linninger, Kunter, & Leutner, 2017; Hansez & Chimel, 2010; Huynh, Xanthopoulou, & Winefield, 2013). Yet recent work also suggests more complex relationships accounting for simultaneous multiple resources and demands. For example, Vogt, Hakanen, Jenny and Bauer (2016) hypothesized that personal resources would provide a “boost effect,” strengthening the relationship between job resources and work engagement. Examining absenteeism as an outcome, van Woerkom, Bakker, and Nishii (2016) found that strengths use (i.e., a personal resource focusing on “employees’ beliefs concerning the extent to which their employer actively supports them in applying their personal strengths at work,” p. 142) exerted the most powerful effects in a three-way interaction, where the strongest buffering effect came when both the emotional demands and workload of employees were high.

The sample in the current study consists of employees who are long-term care workers employed primarily as nursing home assistants and nurses. Like our sample, national statistics indicate approximately 90% of care workers are women (many single mothers) earning low wages of about \$10/hour and living close to the poverty line (Gerstel & Clawson, 2015). Previous research shows that family-related caregiving demands related to elder care, child care, and “sandwiched care” with both elder care and child care demands can negatively influence well-being (e.g., Allen, Johnson, Saboe, Cho, Dumani, & Evans, 2012; Butts, Casper, & Yang, 2013; Eby, Casper, Lockwood, Bordeaux, & Brinley, 2005; Kossek et al., 2001; Neal & Hammer, 2007). Therefore, while all individuals may benefit from interventions to enhance well-being, employees with family caregiving demands may be even more likely to benefit from these initiatives because of their increased risk for psychological distress and perceived stress associated with this multiplicity of demands. Since JD-R studies suggest that the positive influence of resources might be more powerful for those employees with multiple demands, we theorized that the STAR intervention would be more impactful for workers who hold caregiving responsibilities not just at work (as part of their job demands) but also at home in the form of child care, elder care, or both (as part

of their personal demands). As simply put above, such workers may be known as “double-duty” or “triple-duty caregivers” (DePasquale, et al., 2011).

Research supports possible linkages between work-family demands, and psychological problems including depression, anxiety, anger, frustration, and resentment (Allen, Herst, Bruck, & Sutton, 2000; Frone, 2000) and self-reported and biological stress (Almeida, Davis, Lee, Lawson, Walter, & Moen, (2016). Jointly managing conflicting work-family demands can be psychologically distressing for individuals because work responsibilities may inhibit their time and/or performance at home; and family demands may influence time and availability to manage work demands and foster negative affect (Almeida et al., 2016). Managing outside family demands may result in reduced energy and inadequate time for recovery from work demands, which can lead to greater stress and psychological distress for these individuals compared to individuals without family care demands. For these reasons, the intervention’s provision of work resources may be more beneficial to care workers with family demands as they are in greater need of additional work resources such as supervisor family support or work control.

Hypothesis 2: The organizational intervention effects on psychological health will be stronger for employees who have family care demands (providing at least three hours of care a week for children or elders in any caregiving configuration): (a) child caregiving only, (b) elder caregiving only, and (c) both child and elder caregiving, compared to those without caregiving demands.

Different types of family caregiving demands

Although we expect STAR to have a greater impact on individuals with (versus without) caregiving demands, we also consider whether the intervention will be more effective for those with certain types of family caregiving responsibilities – specifically those with elder caregiving responsibilities. Although demands for elder care have risen dramatically in recent years and have forced leading organizations to pay increased attention to employees who are responsible for providing elder care, offering comparative hypotheses is difficult given that relatively few organizational intervention studies have examined elder care (Galinsky, Bond, Sakai, Kim, & Giuntoli, 2008; Kim & Gordon, 2014; Krisor & Rowold, 2013). Therefore, we briefly explain why elder care presents unique challenges and present two research questions.

Elder care responsibilities are often crisis-driven, focused on health problems and death, and result in reduced employee psychological health (Gottlieb, Kelloway, & Fraboni, 1994). Correspondingly, studies suggest that the stressors associated with elder care (Gillespie et al., 2011) are significantly worse than those associated with other caregiving demands (Perrig-Chiello & Hutchison, 2010). Kossek and colleagues (2001) suggest that being employed while providing care for an elder is generally experienced as more psychologically negative than caring for a child, since elder care has a life-cycle focus on decline in well-being and the end of life. Indeed, recent work by Allen and Finkelstein (2014) has demonstrated that different family stages uniquely relate to work-family conflict experiences. From a theoretical perspective, elder caregiving demands might be considered as a (negative) hindrance stressor, whereas child caregiving demands might be considered as

(a more positive) challenge stressor (LePine, Podsakoff, & LePine, 2005). For example, child care, while demanding, may be more likely to be appraised as a positive challenge stressor or demand related to growth such as learning to be a parent or enjoying watching a child develop. In contrast, elder care may be more likely to be appraised as more of a hindrance stressor or demand in that it acts as a barrier to well-being or achieving personal goals (Cavanaugh, Boswell, Roehling, & Boudreau, 2000). Thus, extra work resources may be more useful for developing coping strategies to manage stress for individuals who manage family elder care as they may appraise these demands as an additional burden that may make it harder to fulfil their work responsibilities. Therefore, the STAR intervention might be more impactful for employees with elder care demands versus employees with child care demands.

Second, employees with both child and elder care demands have been labeled the “sandwiched generation” with both sets of responsibilities (Hammer & Neal, 2008). Employees with both child and elder caregiving demands experience multiple forms of roles stress that compete with one another through increased cognitive, emotional or time-based demands, and may ultimately experience the highest levels of stress and absenteeism (Fredriksen-Goldsen & Scharlach, 2001; Hammer & Neal, 2008; Hammer, et al., 2005; ten Brummelhuis & Bakker, 2012). Given the particularly demanding nature of elder care, the STAR intervention may also be more effective in improving psychological health among employees with both elder and child caregiving responsibilities, employees compared to those only with child caregiving responsibilities. We consider the following research questions:

Research Question 1: Will the organizational intervention improve psychological health to a greater extent for those with only elder care demands compared to those with only child care demands?

Research Question 2: Will the organizational intervention improve psychological health to a greater extent for those employees with both child care and elder care demands compared to those with child care demands only?

Methods

Organizational Setting, Background, and Study Randomization Design

The results reported here are original field data that were obtained using survey data from direct care workers in 30 long-term health care facilities across the New England region of the U.S., in a for-profit nursing home employer (referred to as LEEF, a pseudonym). The study took place over eighteen months with 4 time periods of data collected via employee surveys at baseline (pre-intervention), and 6, 12 and 18 month intervals. Figure 2 gives a visual overview of data collection and study design. Facilities were randomly assigned to receive the intervention or not, as part of a field group randomized control field experiment using a repeated measures longitudinal design. The facilities were selected into intervention or control conditions (i.e., usual practice) using a version of Frane’s (1998) adaptive randomization as previously described (Bray et al., 2013). Three criteria were used to balance assignment to control and intervention groups: (1) staff retention rate (since this was

a proxy used to account for unobserved working conditions with higher turnover rates being related to less desirable working conditions; baseline rates ranged from 52% – 84% annually); (2) geographic location (to account for variance in nursing home regulations by state); and (3) the number of eligible direct care employees (to ensure adequate numbers of study participants in each facility).

The research team was blinded to which sites would receive the intervention until after baseline data collection was conducted. In order to avoid the potential for any Hawthorne effects at treatment sites, the organization leaders and control sites were also blinded to which sites received the intervention. This was achieved with two design strategies. First, all 30 sites were recruited for the study with the communications that they were invited to participate in a NIH -sponsored Work, Family and Health study being conducted by their employer (Bray et al., 2013). Employees across the 30 facilities were involved in data collection over eighteen months on how organizational work practices affect employees' work, family and health outcomes, without reference to an intervention. Thus, all sites regardless of intervention assignment perceived they were participating in an NIH-sponsored Work Family and Health Network study (www.workfamilyhealthnetwork.org). After baseline data collection, the intervention was delivered over a 4-month period to 15 randomly selected facilities as a company-sponsored training program that was delivered by personnel who were distinct from the research team.

The intervention—The intervention used in the current study, called STAR, was developed and customized for LEEF to fit the health care context. (For a further description of customization, see Kossek et al., 2017 and Kossek et al., 2014). A comprehensive multi-level intervention integrating two work interventions that had been shown to be empirically effective in previous field research in other industry settings was implemented. One component was related to ROWE, which involved group participation training to increase employee control over work time and processes (previously piloted and described with office workers and IT professionals in Kelly et al, 2011; 2014). The second component involved leader development to increase social support for work and family (i.e., FSSB or family supportive supervisor behaviors) on and off the job, which was piloted in the grocery industry as described in Hammer et al. (2011); and replicated and enhanced with additional content on job supportive supervisor behaviors in 2015 as STAR (Hammer et al., 2015). Examples of customization for the current study involved including pictures of health care workers in the training, a message from top management of the long term care facility, ensuring employees were paid during work time to attend the training, the creation of a steering committee of managers and workers to help implement the initiative, and having the workers consider that any changes in work to improve control over time or schedules, must be safe, legal and cost neutral.

The intervention was delivered periodically over a 4-month period between the baseline and 6 month surveys by experienced trainers in organizational and leader development. STAR was designed to increase supervisor and organizational social support for family and job performance roles; and to increase employees' perceptions of control over work and schedules. This included: "(1) supervisory training on strategies to demonstrate support for employees' personal and family lives while also supporting employees' job performance,

and (2) participatory training sessions to identify new work practices and processes to increase employees' control over work time" (see Kossek et al., 2014, p. 490, for description). Overall, the intervention activities included employee group sessions, after-session work-improvement redesign activities, leader computer-based training, and behavioral self-monitoring by leaders and co-workers.

Participants and survey procedures—Trained interviewers conducted face-to-face, computer-assisted personal interviews with employees at the work site, after consent procedures took place. Employee perceived stress and psychological distress and their work-family backgrounds were measured at baseline and then again at three waves after baseline.

Participants in the study had to meet several criteria: work 24 or more hours a week, provide direct care (e.g., Registered Nurse, Certified/Licensed Nursing Assistant), and work day or evening shifts. Participants at baseline included 1,524 (725 intervention, 799 control) employees. Overall, 931 participants (420 intervention, 511 control) completed surveys at baseline, and 6-, 12-, and 18-months after the intervention. Analyses were conducted to ensure there were no meaningful significant effects between employees at baseline and the final sample. Nearly all of the employees were female ($N = 859$, 92.3%). About two-thirds were white ($N = 610$, 65.5%) and married or cohabiting with a partner ($N = 395$, 42.4%). Participants ranged in age from 18 to 72 years old ($M = 39.7$, $SD = 12.3$). More than half of the sample ($N = 524$, 56.34%) reported having at least one child 18 years or younger living in the home. Nearly one-third of the sample ($N = 276$, 29.7%) reported engaging in elder care activities for an adult relative at least 3 hours or more per week during the previous 6 months. Only 11.08% of employees ($N = 103$) reported graduating from college and 49.03% ($N = 645$) reported taking some courses at college or a technical school. On average, employees reported earning between \$40,000–49,999 per year, working 36.9 hours per week ($SD = 7.2$), and having tenure at the company of 7.47 years ($SD = 7.16$).

Measures

Psychological health—*Psychological distress* was measured using six items from the K-6 Mental Health Screening Questionnaire (Kessler et al., 2003). The items included “so sad nothing could cheer you up,” “nervous,” “restless or fidgety,” “hopeless,” “worthless,” and that “everything was an effort.” Participants reported the amount of time they felt sad, nervous, restless/fidgety, like everything was an effort, and worthless during the past 30 days (1 = all of the time, 5 = none of the time). Items were reverse-scored and summed so that higher scores reflected more psychological distress. Cronbach's alpha was adequate and generally consistent across waves: baseline (.84), 6-months (.84), 12-months (.86) and 18-months (.85).

Perceived stress was measured using four items from the Perceived Stress Scale originally developed by Cohen, Kamarck, and Mermelstein (1983). Respondents used this stem to answer the following items: “In the last month, how often have you felt.... unable to control the important things in life; confident about ability to handle personal problems (R); that things were going your way (R); and that difficulties were piling so high that you could not overcome them. This 4-item scale has been found to be a reliable and valid measure of

perceived stress (Cohen et al., 1983). Employees used a 5-point numerical rating scale (1 = very often, 5 = never). After reverse-coding select items noted above, all items were summed so that higher scores reflected more perceived stress. Cronbach's alpha was adequate at each wave: baseline (.76), 6-months (.74), 12-months (.76) and 18-months (.76).

Family caregiving demands moderators—Employees reported the number of children living in their home for 4 or more days per week and the age of each child. To reflect child care responsibilities, a dichotomous variable was created indicating whether employees had a child 18 years or younger living in the home (1 = yes, 0 = no). To assess elder care responsibilities, employees reported whether they provided at least 3 hours of care per week during the past 6 months to an adult relative inside or outside the home (e.g., shopping, medical care, assistance in financial/budget planning; 1 = Yes, 0 = No). The child care and elder care responsibility variables were used to create a sandwiched care variable (1 = has both child care and elder care responsibilities, 0 = does not have both child care and elder care responsibilities). This measure has found to be a reliable measure of caregiving demands for elderly and sandwiched generation caregivers (Neal & Hammer, 2007). It assesses elder caregiving for parents or a disabled spouse or other adult family members. It was initially developed by Gorey, Brice & Rice as a validated elder care needs assessment measure (1990). Because (1) there has been more work on assessing marital status differences (e.g., ten Brummelhuis & Van Der Lippe, 2010) compared to caregiving status differences, and (2) separate analyses revealed no significant intervention effects for marital status differences, we focused on caregiving for parsimony.

Analyses

Multi-level mixed models for cluster-randomized designs were used to test the study hypotheses and to account for the nesting of assessments within participants (i.e., baseline, 6, 12 & 18-months) and participants within clusters (Donner & Klar, 2004; Murray, Varnell, & Blitstein, 2004; Varnell, Murray, Janega, & Blitstein, 2004). In addition to specifying a cluster-level random effect, these models include a parameter contrasting the intervention and control condition at baseline, a set of parameters contrasting each post-intervention assessment with the baseline assessment (i.e., mean change over time) in the intervention condition, and a set of parameters that contrast the difference in changes over time between baseline and each post-intervention assessment period between the intervention and control conditions (i.e., two-way interaction of the intervention and wave indicators). Importantly, this last set of two-way interaction parameters defines the intervention effects (see e.g., Bodner & Bliese, 2017). Analyses to test for moderated intervention effects add to this model a predictor for that moderator variable, all possible two-way interactions, and a three-way interaction. It is also important to note that these three-way interactions (i.e., wave by condition by moderator) define the moderated intervention effects. These models have been used successfully in other cluster-randomized workplace intervention studies (e.g., Hammer, et al., 2015; Kelly, et al., 2014).

Intent- to-treat analytical approach—Analyses were conducted using Proc Mixed in SAS using an intent-to-treat framework (Gupta, 2011). Intent-to-treat analysis is a very rigorous approach to data analysis that helps avoid overestimating the benefits of the

intervention; and is as a way to improve statistical analysis of randomized control studies (Fisher et al., 1990; Gupta, 2011). Often used in clinical medical trials, this analytical method is beginning to be used in organizational and occupational health research. All employees in the samples are included in the analyses, regardless of the many inevitable events that can occur after the intervention implementation (Kruse et al., 2002). Some intervention studies remove intervention sample participants from analyses due to dropping out or noncompliance with the intervention protocol, which leads to possibly overestimating the intervention's efficacy.

The maximum likelihood routines employed in SAS Proc Mixed are ideal for longitudinal studies where missing data due to attrition is likely as the SAS routines only require the milder MAR assumption rather than the more stringent MCAR assumption required by routines like listwise deletion with OLS estimation. Separate analyses were conducted for psychological distress and perceived stress. The family care variable baseline values were used to examine moderated intervention effects. The effect size d is used to describe the practical magnitude of the intervention and moderated intervention effects; d is a standardized mean difference equal to the parameter estimate (i.e., differences in mean change) divided by the within-condition standard deviation of outcome variable scores at baseline (cf., Feingold, 2009).

Results

For descriptive purposes, Table 1 provides the adjusted means of psychological health (perceived stress and psychological distress) from general linear mixed models at each wave of data collection by condition (control/intervention) and family caregiving demands (child care, elder care, sandwiched). Table 2 provides means, standard deviations, and correlations among the two outcome variables and moderator variables. Later tables show significance tests of the contrasts. Prior to conducting analyses to test the hypotheses, an examination of missing data and attrition was conducted. For participants who completed surveys, there was little missing data for psychological distress and perceived stress, ranging from 0–4 missing observations at each phase of data collection. As would be expected in a longitudinal study in a high turnover, lower paid industry, there was some sample attrition across the four time points. Independent sample t-tests and chi-square analyses were conducted to examine whether people who completed assessments at all four time points (non-attriters, $N = 931$) differed from those who completed assessments at less than four time points (attriters, $N = 590$). Results revealed that the attriters did not significantly differ from the non-attriters in baseline perceived stress or psychological distress. The two groups also did not differ in terms of baseline reported elder care, child care, or sandwich care responsibilities. Baseline means for the intervention and control conditions also revealed that the care groups (elder, child, sandwiched) did not significantly differ in psychological distress (means = 11.91 v. 11.89) or perceived stress (means = 9.46 v. 9.57) prior to assessing exposure to the intervention.

Hypothesis 1: Intervention Effects

Column 1 of Tables 3 and 4 provide the results of mixed model analyses of intervention effects on psychological distress and perceived stress, respectively. Intervention effects at various time periods, relative to baseline, appear as the two-way interactions in these columns. As displayed in Table 4, perceived stress decreased significantly in intervention locations, relative to baseline, at the 6-, 12-, and 18-month periods ($\gamma = -0.22$, $p = .050$, $\beta = .07$, $\gamma = -0.43$, $p < .001$, $\beta = .14$, and $\gamma = -0.50$, $p < .001$, $\beta = .16$, respectively). However, there was no significant evidence that perceived stress decreased at a lesser rate in the control locations at the 6-month ($\gamma = -0.07$, $p = .629$), 12-month ($\gamma = 0.02$, $p = .911$), or 18-month ($\gamma = 0.23$, $p = .170$) periods. Therefore, no intervention effects were found on perceived stress.

Although psychological distress decreased significantly in intervention locations, relative to baseline, at the 12- and 18-month periods ($\gamma = -0.70$, $p < .001$, $\beta = .16$ and $\gamma = -0.89$, $p < .001$, $\beta = .21$, respectively; Table 3), there was no significant evidence that psychological distress decreased at a lesser rate in the control locations at the 6-month ($\gamma = -0.35$, $p = .096$), 12-month ($\gamma = 0.18$, $p = .406$), or 18-month ($\gamma = 0.27$, $p = .239$) periods. Therefore, no intervention effects were found on psychological distress, which failed to support our first hypothesis.

Hypothesis 2 and Research Questions: Moderated Intervention Effects

When examining participants with different family caregiving structures, we hypothesized that the intervention was more beneficial for some family structures relative to others. The family caregiving structures of primary interest are elder care, child care and sandwiched care responsibilities. Columns 2 through 5 of Tables 3 and 4 provide the results of mixed model analyses of moderated intervention effects on perceived stress and psychological distress, respectively, for each of the moderators. Moderated intervention effects at various time periods, relative to baseline, appear as the three-way interactions in these columns.

Child care (H2a)—Column 3 of Tables 3 and 4 provide the results of mixed model analyses comparing intervention effects for participants with and without child care responsibilities. Child care alone was a significant moderator of the intervention effects on perceived stress at 18 months ($\gamma = .78$, $p = .002$, $\beta = .34$). At the 18-month time period, the intervention was significantly more beneficial in reducing perceived stress for those with child care responsibilities than for those without child care responsibilities (Figure 3). However, child care alone was not a significant moderator of the intervention effects on psychological distress and perceived stress at any other time period.

Elder Care (H2b)—Column 2 of Tables 3 and 4 provide the results of mixed model analyses comparing intervention effects for participants with and without elder care responsibilities. With respect to perceived stress, at the 12-month time period the intervention was significantly more beneficial in reducing perceived stress for those with elder care responsibilities than for those without elder care responsibilities ($\gamma = -1.08$, $p = .007$, $\beta = .35$; Figure 4b). For employees with elder care responsibilities, the reduction in perceived stress from baseline to 12-months was significantly greater in the intervention

locations than in the control locations ($\gamma = -0.81, p = .017, \eta^2 = .26$). In contrast, for employees without elder care responsibilities, no significant reduction in perceived stress from baseline to 12-months was observed across intervention and control conditions ($\gamma = -.27, p = .160$). However, this significant moderator effect and benefit was not observed at the 6- and 18-month time periods ($\gamma = -0.41, p = .265$ and $\gamma = -0.57, p = .158$, respectively).

At the 12-month time period, there was evidence of a moderated intervention effect such that the intervention was significantly more beneficial in reducing psychological distress for those with elder care responsibilities than for those without elder care responsibilities ($\gamma = -1.07, p = .046, \eta^2 = .25$; Figure 3). To help interpret the meaning of this interaction, we consider the simple intervention effects for those with and without elder care. For employees with elder care responsibilities, the reduction in psychological distress from baseline to 12-months was significantly greater in the intervention locations than in the control locations ($\gamma = -0.97, p = .032, \eta^2 = .23$). In contrast, for employees without elder care responsibilities, no significant reduction in psychological distress from baseline to 12-months was observed across intervention and control conditions ($\gamma = 0.10, p = .712$). However, this significant moderator effect was not observed at the 6- and 18-month time periods ($\gamma = -0.07, p = .894$ and $\gamma = -0.42, p = .442$, respectively). Taken together, these results indicate the intervention was more beneficial for those with than without elder care responsibilities at 12-months (relative to baseline).

Sandwiched care (H2c)—Column 4 of Tables 3 and 4 provide results of mixed model analyses comparing moderating effect of the intervention for participants with and without sandwiched responsibilities.

For perceived stress, the intervention was significantly more beneficial in reducing perceived stress for those with sandwiched care responsibilities than for those without sandwiched care responsibilities at the 12-month time period ($\gamma = -1.22, p = .024, \eta^2 = .40$; Figure 4c). For employees with sandwiched care responsibilities, the reduction in perceived stress from baseline to 12-months was significantly greater in the intervention locations than in the control locations ($\gamma = -1.06, p = .035, \eta^2 = .34$). In contrast, for employees without sandwiched care responsibilities, no significant reduction in perceived stress from baseline to 12-months was observed across intervention and control conditions ($\gamma = 0.16, p = .378$). However, this significant moderator effect and benefit was not observed at the 6- and 18-month time periods ($\gamma = -0.39, p = .429$ and $\gamma = -0.06, p = .917$, respectively). Tests revealed sandwiched care was not a significant moderator of intervention effects on psychological distress at any time period.

Elder care versus child care (Research Question 1)—At the 12-month time period, Figure 4a shows that the intervention was more effective in reducing perceived stress ($\gamma = -1.26, p = .023, \eta^2 = .41$) and psychological distress ($\gamma = -1.48, p = .052, \eta^2 = .35$) for individuals with elder care than for child care demands. At the 18-month time period, Figure 4b shows the intervention was also more effective in reducing perceived stress ($\gamma = -1.39, p = .016, \eta^2 = .45$), but did not significantly reduce psychological distress ($\gamma = -1.30, p = .099$) for individuals with elder care demands compared to those with child care demands.

Sandwiched care versus child care comparison (Research Question 2)—

Similar comparisons were examined between sandwiched caregiving and child care. Figure 4c shows that at the 12-month time point, the intervention significantly reduced perceived stress ($\gamma = -1.83$, $p = .002$, $d = .59$) for individuals providing sandwiched care responsibilities compared to those providing only child care.

Summary of moderator caregiving pattern results over time—Taken together the results show the following patterns for perceived stress and psychological distress. First, there was a modest pattern of results suggesting that about a year after baseline (about 8 months after the intervention was completed); exposure to the intervention was beneficial for improving psychological health for both double-duty caregivers and triple-duty caregivers. For double-duty elder caregivers, the intervention was effective in reducing perceived stress and psychological distress at 12 months. For triple-duty caregivers, perceived stress but not psychological distress was lower at 12 months compared to similar individuals in control sites. There was one finding of benefit for lower perceived stress at 18 months for double duty long-term caregivers who had child care demands compared to their control group counterparts. Another consistent finding was that no beneficial intervention effects were found at any time period for any professional elder caregiver worker who did not also provide care for a family member off the job.

Discussion

Scientific evidence is needed to further support the notion that employer-adopted organizational interventions that provide job resources of workplace social support and job control in a results-oriented work environment are beneficial for employee psychological health. There is relatively little multi-level research using a longitudinal randomized control design with an intent-to-treat analytical approach that examines organizational interventions to enhance well-being for professional elder caregivers. The STAR intervention did not result in main effect improvements in well-being for the overall workforce in experimental versus control sites and showed no benefits of the intervention for professional caregivers without outside care demands. Yet the current study demonstrates that employees with additional elder care demands (and in one instance child care demands alone) at work sites adopting the intervention improve more in psychological health than those in control sites. STAR did provide resources helpful for workers overloaded with double- or triple-duty elder care demands from experiencing higher stress and psychological distress, compared to similar worker control groups about a year after the baseline measurement of well-being. The current study shows that when implementing organizational job resource-enhancing interventions, it is possible to improve the psychological health of workers with elder care and sandwiched care demands. These findings are consistent with research by Clauss and colleagues (2016) which found that employees with a higher need for recovery were more likely to benefit from an individual level positive reflection intervention. Compared to employees without elder care demands, future research should explore whether individuals who care for elders on and off the job have a greater need for recovery.

The research extends previous work by Hammer and colleagues (2015), which found STAR benefited OCB and safety compliance behaviors but did not change target measures of job

control or FSSB between control and intervention sites. Such results, and the lack of general main effect results for psychological health for the overall workforce in the current study doesn't challenge the validity of the STAR intervention findings but rather suggests that the mechanisms by which these effects were obtained were not through the theoretically predicted mechanisms used in the original design of the intervention but some other psychosocial mechanisms that need to be identified in future research. This study shows that unlike the research on STAR's positive main effect benefits with IT workers (Kelly et al., 2014), in a context with 24-7 tightly regulated health care shift work, and many low-income hourly workers, there may be limits to the general benefits of the support and control resources we studied. Future research should examine the effects of other organizational structural contextual resources such as increasing pay and staffing levels (Kossek et al., 2016). A contribution of this paper is that it demonstrates interventions developed in one occupational context may not necessarily transfer effectively or have the same effects in other job contexts. Replication of common intervention components that are most effective across a majority of work contexts is needed, and identification of features that can be tailored to accommodate the unique stressors of various work and nonwork domains.

Stress and Psychological Distress Patterns

The result patterns identified in this study show that exposure to the intervention improved perceived stress and psychological distress at 12 months for elder caregivers who also cared for elderly family members. The intervention we tested was more effective in helping to ameliorate perceived stress, a felt gap between resources and demands for these overburdened caregivers, but such interventions may not be as effective for more acute psychological health challenges of sandwiched caregivers with higher psychological distress. Given the differentiation of perceived stress and psychological distress, if the intervention is based on providing more resources and control then perceived stress should improve; however, the effects on long term psychological distress as a reaction to previous stressful conditions (before the intervention) may take longer, especially on those who are managing family elder and sandwiched care. It is also possible that these results suggest that for those caregivers with more severe mental health challenges, a mental health intervention that is designed to address specific symptoms of psychological distress related to child and elder care demands may be needed. The results suggest stress and psychological distress, while correlated, may require different interventions when targeting double- and triple-duty caregivers.

Finally, while managing at least three additional hours of family care a week may not seem like much, this does indicate a regular dependent caregiving role involvement. It may be that juggling care work with family demands results in expending emotional labor managing or thinking about family care while working (referred to as "compassion fatigue" by Ward-Griffin et al., 2011, p. 1) and vice versa. While for parsimony, we maintained the brevity of the care measures, future work should include in-depth measurement of family care demands, which we elaborate on below.

Employee Caregiving Obligations and Intervention Effectiveness

Drawing on JD-R principles, it is possible that the intervention increased positive resources that protected caregivers with additional family elder care demands by building various individual resources (Bakker, et al., 2014; ten Brummelhuis and Bakker, 2012). These include resources such as social support, constructive resources, and energies. Future research utilizing JD-R should consider both the type and degree of caregiving demands as well as the nature of the resources offered in the intervention. Specifically, the current intervention was designed to target multiple types of resources that could benefit employees and results suggest that future research might identify psychosocial resources specific to paid elder caregivers and supports for their elder and child care needs. Moving forward, we echo recent calls to examine how intervention studies can build resources and contribute to promoting psychological or mental health (Vuori, Toppinen-Tanner, & Mutanen, 2012).

The goal of the current study was to create and implement a holistic longitudinal intervention that examined multiple aspects of an employee's work and nonwork domains. Therefore, the ability to conduct a sophisticated assessment of the nuances of child care demands was not possible. Future research should conduct more fine-grained analysis of the nature of demands of caring for children who are between the ages of under 18 years or younger living in the household. Research is needed on the different intervention benefits for workers with diverse care configuration demands. Previous research has shown that working parents' varying dependent child care profiles (e.g., infant only, toddler only, school age only, or mixed care combining toddler and infant care) predicted variance in child care problems, attitudes toward managing work and child care responsibilities, and absence behavior (Kossek, 1990). Given that developmental research finds that parents spend less time with their children as they age from infancy to adolescence (Larson, Richards, Moneta, & Holmbeck, 1996), it is likely that the child care responsibilities of the parents in the study varied between families. These differential intervention effects could function as a starting point for informing the design of interventions that address the psychological health needs of employees with different caregiving demands, which might improve the effectiveness of employer work-life supports. While the most consistent benefits of the intervention were for those caring for at least one elderly family member, it was interesting that we observed benefits of the intervention for reducing perceived stress at 18 months for working caregiver parents in facilities that received the intervention compared to employees without dependents.

Future studies should examine how the appraisal processes of elder and child caregiving demands translates into challenge and hindrance stressors in terms of individual differences. As we suggested, it is possible that dependent care demands were viewed as both challenges and hindrances (Staufenbiel & König, 2010). Given that attributional processes play a critical role in shaping the perception of a stressor or demand, future research should more directly examine how such elder and child caregiving demands are appraised within this framework to design interventions.

Further, individuals working in health care jobs may be drawn to these occupational domains because of their identification with and passion for delivering quality caregiving. Therefore, health care employees with family caregiving obligations may be more likely to experience

multiple sources of stress, due to their caring for others at work and at home. Examining how the variability in caregiving obligations lessens or increases the effectiveness of organizational interventions – particularly for those whose job is to take care of others – is an important next-step in understanding how these interventions can be designed to maximize utility.

Emphasizing Psychological Health in Organizational Change and Work-Family Studies

Our results also suggest the value of including outcomes of psychological health such as perceived stress and psychological distress in work-family studies, as most currently focus on measuring work-family conflict, which as noted, Hammer et al. (2015) found was unchanged by the STAR intervention. The work-family and occupational health literatures would benefit from improved integration by having intervention studies include psychological health outcomes, which are widely measured in the job stress literature.

Future research may consider the dynamic nature of how interventions can reduce perceived stress which, in turn, influences other stress responses like psychological distress (as suggested by transactional stress models; Ensel & Lin, 1991). Such research might specify whether there are sequential or two distinct processes that take place in relation to each outcome. It may be, for example, that organizational interventions may be particularly effective for psychological health issues that are acutely and narrowly represented in the population, (psychological distress or other forms of serious mental health indicators). Future studies also should replicate and compare the organizational change effectiveness approaches from mainstreaming, focusing on individual differences in need, or other factors recommended such as organizational change readiness (Nielson et al., 2008).

Future Work on Organizational Intervention Sustainability and Change Targets

Our study showed that the elder care intervention effects began to dissipate by 18 months in some sites; and new effect emerged for those with child care responsibilities at 18 months. Most empirical studies of interventions only look at change between two points in time, thus overlooking the fluctuating patterns and sustainable nature of change initiatives. Our findings shed light on the complex nature of organizational change. Future studies should examine the processes of implementing organizational interventions over time, and how to improve sustainability. Most previous research studies end measurement evaluation soon after the conclusion of the change process. Assessments should take into account a time lag for effects to occur about 6–8 months after intervention exposure as we found. These findings align with intervention researchers' suggestion that it may take time for psychological health effects to respond to a psychosocial work intervention, which should be considered in occupational health evaluations (Landsbergis & Vivona-Vaughan, 1995). As results for the double and triple-duty caregivers began to expire at 18 months, the study suggests that organizational “boosters” or renewed change activities are required at 18 months in order to sustain the interventions. Variation in the process and outcomes of intervention sustainability need to continue to be explored in future practice and research (Anger et al., 2015, Biron et al., 2011).

Action research might also examine the notion of distal and proximal change targets in the design of interventions. The STAR intervention focused on changing the structure of work (a distal change target to the employee) rather than the employees' stress and distress directly (a proximal change target). It could be that mainstreaming different interventions that specifically target improving personal health behaviors, such as increasing exercise or healthy eating; or provide specific resources for personal child or elder care assistance, may have closer proximity to employees' psychological health. Lastly, more research might focus on using the intent-to-treat approach in analyses, as employees and work units will inevitably vary in the degree to which their work sites embrace intervention implementation or exhibit resistance to change.

Study Limitations and Conclusions

All studies have limitations. Although the current study utilized a randomized controlled field experiment, in order to maximize validity due to relatively high turnover rates common to this industry, more research needs to be done to follow people after they leave the organization. We found, however, no significant differences in the psychological health of stayers and those who turned over.

Another limitation involves outcome measurement. There is a possibility that our shortened version of the perceived stress measure (4 items) does not capture stress as well as the longer, original version. However, researchers frequently use the shortened 4-item version, which has been validated (Warttig, Forshaw, South, & White, 2013). Using a shorter measure helped reduce respondent burden of completing a longer repeated measure four times over an 18-month period, which likely was beneficial in reducing missing data.

Another limitation relates to the reported levels of psychological distress and perceived stress. Overall, our study participants reported low levels of psychological distress and perceived stress, which could pose problems for our analyses. Floor effects – in which a measured scale is at or near its logical minimum – might potentially explain why we did not find an overall main effect of the intervention on psychological distress and perceived stress. Although certainly a possibility, both psychological distress and perceived stress have standard deviations such that even a large standardized effect for either measure (i.e., Cohen's $d \gg 0.8$) would be within the logical range of the measure. For psychological distress, a Cohen's d of 0.8 implies an effect of 3.4 on the scale or a post-intervention effect mean of about 8.7, relative to a minimum of 6. Similarly, a Cohen's d of 0.8 would imply a post-intervention effect mean of perceived stress of about 7, relative to a minimum of 4. Thus, both measures have sufficient range for intervention effects to manifest. Nonetheless, the potential that larger effects might be found in a more distressed sample is of concern and remains a possible explanation for the general lack of statistical significance.

Regression to the mean is another potential concern for our findings. The results for the main effects suggest that the all study subjects experienced reductions in psychological distress and perceived stress post-baseline, consistent with the regression to the mean. If those with caregiving responsibilities had higher levels of psychological distress or perceived stress at baseline, the potential for a greater regression to the mean effect could lead to bias in our estimate of the moderated intervention effect. The main effect of the

moderator in Tables 3 and 4, however, suggest that those with caregiving responsibilities had lower levels of psychological distress or perceived stress, not higher. Furthermore, neither the control group main effect nor the interaction between the control group and moderator are significant, indicating that randomization resulted in matched intervention and control groups on the relevant characteristics. Therefore, we do not think that regression to the mean is a potential source of bias in our estimated intervention effects.

It is also possible that the moderating effects of caregiving obligations on the effectiveness of the organizational intervention and employee psychological health was context specific, given we focused on a large female population of hourly employees involved in care work—many of whom were also single parents. Family caregiving as a moderator of intervention effectiveness is likely to vary by occupational domains and employee resources. Interventions are likely to be most effective when tailored for the individuals for whom they are targeting. Additionally, the current study measured child care and elder care as dichotomous assessments. Future research should account for the diversity, complexity, and dynamic nature of caregiving demands with more fine-grained measures.

However, relatively few empirical studies have examined these questions in a manner allowing causal explanations to be determined. Therefore, in an effort to begin to demonstrate the nature of the effects in a controlled, randomized longitudinal field experiment, this study begins to address the research question of whether a holistic psychosocial intervention is effective for all long-term health care employees with caregiving demands.

The findings showing some more consistent patterns of beneficial results for elder care than child care need to be replicated. It could be that our results were because supervisors might have been more aware of child care responsibilities prior to intervention, but less attuned to elder care. An additional explanation is that since this employee population focuses on extended-care, there may be emotional transference from their work to the home elder care experience. Alternatively, it may be the case that the utility of an intervention is contingent on the nature of the caregiving demands employees face. Perhaps, for example, on-site child care would be a more helpful job resource than a psychosocial intervention for working parents.

Conclusions—Future research should build on this study to conduct needs assessments of the types of organizational interventions that would specifically improve the psychological health for health care workers with child care, elder care, and sandwiched care demands. Our results show some benefits over time of taking some preventative action to increase work contextual resources. Research is needed on how to sustain and customize such initiatives for lasting change.

Particularly in work contexts where workers do not have a lot of control and discretion in the structure of work, this study suggests that consideration of subgroup differences in need and demand for the intervention need are likely to be important moderators of the effectiveness on psychological health. While organizations may want to offer common interventions across the workforce for ease of communication and administration, this study suggests that

change strategies to improve psychological health particularly for caregivers who care for the elderly on and off the job may need to be “elder care conscious.” Such an approach would customize interventions to the specific needs of employees providing care for aging family members. The growth in formal long-term health care work for the elderly as a profession has important implications for the well-being and psychological health of these caregivers themselves and their families and society. Organizational interventions focused on increasing psychosocial work environment resources need to continue to be developed, evaluated, and replicated to foster occupational resilience.

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References

- AbuAlRub RF. Job stress, job performance, and social support among hospital nurses. *Journal of Nursing Scholarship*. 2004; 36:73–78. [PubMed: 15098422]
- Avison WR, Ali J, Walters D. Family structure, stress, and psychological distress: A demonstration of the impact of differential exposure. *Journal of Health and Social Behavior*. 2007; 48:301–317. [PubMed: 17982870]
- Allen TD, Armstrong J. Further examination of the link between work–family conflict and physical health: the role of health-related behaviors. *American Behavioral Science*. 2006; 49:1204–1221.
- Allen TD, Herst DEL, Bruck CS, Sutton M. Consequences associated with work-to-family conflict: A review and agenda for future research. *Journal of Occupational Health Psychology*. 2000; 5:278–308. DOI: 10.1037/1076-8998.5.2.278 [PubMed: 10784291]
- Allen TD, Finkelstein L. Work–family conflict among members of full-time dual-earner couples: An examination of family life stage, gender, and age. *Journal of Occupational Health Psychology*. 2014; 19:376–384. [PubMed: 24885688]
- Allen TD, Johnson RC, Saboe KN, Cho E, Dumani S, Evans S. Dispositional variables and work–family conflict: A meta-analysis. *Journal of Vocational Behavior*. 2012; 80:17–26.
- Almeida DM, Davis KD, Lee S, Lawson KM, Walter KN, Moen P. Supervisor support buffers daily psychological and physiological reactivity to work-to-family conflict. *Journal of Marriage and Family*. 2016; 78:165–179. DOI: 10.1111/jomf.12252 [PubMed: 26778857]
- Almeida, DM., Wong, JD. Life transitions and daily stress processes. In: Elder, GH., Jr, Giele, JZ., editors. *The craft of life course research*. New York: Guilford Press; 2009. p. 41-162.

- Anger K, Elliott D, Bodner T, Olson R, Rohlmon D, Truxillo D, ... Montgomery D. Effectiveness of total worker health interventions. *Journal of Occupational Health Psychology*. 2015; 2:226–247.
- Bakker A, Demerouti E. The job demands-resources model: State of the art. *Journal of Managerial Psychology*. 2007; 22:309–328.
- Bakker, AB., Demerouti, E. Job demands–resources theory: Taking stock and looking forward. *Journal of Occupational Health Psychology*. 2016. <http://dx.doi.org/10.1037/ocp0000056>
- Bakker AB, Demerouti E, Euwema MC. Job resources buffer the impact of job demands on burnout. *Journal of Occupational Health Psychology*. 2005; 10(2):170. [PubMed: 15826226]
- Bakker AB, Demerouti E, Sanz-Vergel AI. Burnout and work engagement: The JD–R approach. *Annual review of Organizational Psychology Behavior*. 2014; 1(1):389–411.
- Berkman, LF., Liu, SY., Hammer, L., Moen, P., Klein, LC., Kelly, E., Buxton, OM. Work–family conflict, cardiometabolic risk, and sleep duration in nursing employees. *Journal of Occupational Health Psychology*. 2015. <http://dx.doi.org/10.1037/a0039143>
- Biron, C., Cooper, CL., Gibbs, P. Stress interventions versus positive interventions: Apples and oranges. In: Cameron, KS., editor. *The Oxford handbook of positive organizational scholarship*. Oxford: Oxford University Press; 2011. p. 938–950.
- Biron, C., Karinka-Murray, M., Cooper, C., editors. *Organizational stress and well-being interventions: Addressing process and context*. London: Psychology Press; 2011.
- Blustein DL. The role of work in psychological health and well-being. *American Psychologist*. 2008; 63:228–240. DOI: 10.1037/0003-066x.63.4.228 [PubMed: 18473608]
- Bodner, T., Bliese, P. Detecting and differentiating the direction of change and intervention effects in randomized trials. *Journal of Applied Psychology*. 2017. Advance online publication. <http://dx.doi.org/10.1037/apl0000251>
- Bono JE, Glomb TM, Shen W, Kim Y, Koch A. Building positive resources: Effects of positive events and positive reflection on work-stress and health. *Academy of Management Journal*. 2013; 56:1601–1627.
- Butts MM, Casper WJ, Yang TS. How important are work–family support policies? A meta-analytic investigation of their effects on employee outcomes. *Journal of Applied Psychology*. 2013; 98(1): 1–25. [PubMed: 23106685]
- Bray, JW., Kelly, E., Hammer, LB., Almeida, DM., Dearing, JW., King, RB., Buxton, OM. *Methods report*. RTI Press; 2013. An integrative, multilevel, and transdisciplinary research approach to challenges of work, family, and health; p. 1
- Cameron, C., Moss, P. *Care work in Europe: Current understandings and future directions*. New York: Routledge; 2007.
- Cavanaugh MA, Boswell WR, Roehling MV, Boudreau JW. An empirical examination of self-reported work stress among US managers. *Journal of Applied Psychology*. 2000; 85(1):65. [PubMed: 10740957]
- Clauss, E., Hoppe, A., O’Shea, D., González Morales, MG., Steidle, A., Michel, A. Promoting personal resources and reducing exhaustion through positive work reflection among caregivers. *Journal of Occupational Health Psychology*. 2016. <http://dx.doi.org/10.1037/ocp0000063>
- Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. *Journal of Health and Social Behavior*. 1983; 24:385–396. [PubMed: 6668417]
- Cohen, S., Williamson, G. Perceived stress in a probability sample in the United States. In: Spacapan, S., Oskamp, S., editors. *The Social Psychology of Health*. Newberry Park, CA: Sage; 1988. p. 31–67.
- Crain TL, Hammer LB, Bodner T, Kossek EE, Moen P, Lilienthal R, Buxton OM. Work–family conflict, family-supportive supervisor behavior (FSSB), and sleep outcomes. *Journal of Occupational Health Psychology*. 2014; 19:155–167. DOI: 10.1037/a0036010 [PubMed: 24730425]
- DePasquale N, Davis KD, Zarit SH, Moen P, Hammer LB, Almeida DM. Combining formal and informal caregiving roles: The psychosocial implications of double- and triple-duty care. *The Journals of Gerontology Series B: Psychological Sciences and Social Sciences*. 2016; 71:201–11.

- Dicke, T., Stebner, F., Linninger, C., Kunter, M., Leutner, D. a longitudinal study of teachers' occupational well-being: Applying the job demands-resources model. *Journal of Occupational Health Psychology*. 2017. <http://dx.doi.org/10.1037/ocp0000070>
- Dimoff JK, Kelloway EK, Burnstein MD. Mental health awareness training (MHAT): The development and evaluation of an intervention for workplace leaders. *International Journal of Stress Management*. 2016; 23:167.
- Donner A, Kolar N. Pitfalls of and controversies in cluster randomization trials. *American Journal of Public Health*. 2004; 94:416–422. [PubMed: 14998805]
- Eby LT, Casper WJ, Lockwood A, Bordeaux C, Brinley A. Work and family research in IO/OB: *Content analysis and review of the literature (1980–2002)*. *Journal of Vocational Behavior*. 2005; 66:124–197.
- Ensel W, Lin N. The life stress paradigm and psychological distress. *Journal of Health and Social Behavior*. 1991; 32:321–341. [PubMed: 1765624]
- Feingold A. Effect sizes for growth-modeling analysis for controlled clinical trials in the same metric as for classical analysis. *Psychological Methods*. 2009; 14:43–53. DOI: 10.1037/a0014699 [PubMed: 19271847]
- Fisher, LD., Dixon, DO., Herson, J., Frankowski, RK., Hearron, MS., Peace, KE. Intention to treat in clinical trials. In: Peace, KE., editor. *Statistical issues in drug research and development*. New York: Marcel Dekker; 1990. p. 331-350.
- Fredriksen-Goldsen, KI., Scharlach, AE. *Families and work: New directions in the twenty-first century*. New York: Oxford University Press; 2001.
- Frone MR. Work–family conflict and employee psychiatric disorders: The national comorbidity survey. *Journal of Applied Psychology*. 2000; 85:888–895. DOI: 10.1037/0021-9010.85.6.888 [PubMed: 11155895]
- Galinsky, E., Bond, JT., Sakai, K., Kim, SS., Giuntoli, N. *National study of employers*. New York, NY: Families and Work Institute; 2008.
- Ganster DC, Rosen CC. Work stress and employee health a multidisciplinary review. *Journal of Management*. 2013; 39:1085–1122.
- Gelsma T, van der Doerf M, Maes S, Akerboom S, Verhoeven C. Job stress in the nursing profession: The influence of organizational and environmental and job characteristics. *International journal of Stress Management*. 2005; 12:222–240.
- Gerstel, N., Clawson, D. Low wage care workers: extended family as a strategy for survival. In: Duffy, M.Armenia, A., Stacey, C., editors. *Caring on the Clock*. New Brunswick, NJ: Rutgers University Press; 2015. p. 179-188.
- Gillespie JZ, Barger PB, Yugo JE, Conley CJ, Ritter L. The suppression of negative emotions in elder care. *Journal of Managerial Psychology*. 2011; 26:566–583.
- Gorey K, Brice G, Rice R. An elder care training needs assessment among employee assistance program staff. *Employee Assistance Quarterly*. 1990; 5:71–93.
- Gottlieb BH, Kelloway EK, Fraboni M. Aspects of elder care that place employees at risk. *The Gerontologist*. 1994; 34:815–821. [PubMed: 7843611]
- Gupta S. Intention to treat concept: A review. *Perspectives on Clinical Research*. 2011; 2:109–112. DOI: 10.4103/22293485.83221
- Hammer, L., Densky, C., Kossek, E., Bray, J. Work-family intervention research. In: Allen, TD., Eby, LT., editors. *Oxford Handbook of Work and Family*. Oxford, U.K: Oxford University Press; 2015.
- Hammer LB, Kossek EE, Anger WK, Bodner T, Zimmerman KL. Clarifying work–family intervention processes: The roles of work–family conflict and family-supportive supervisor behaviors. *Journal of Applied Psychology*. 2011; 96:134–150. [PubMed: 20853943]
- Hammer LB, Johnson RC, Crain TL, Bodner T, Kossek EE, Davis KD, ... Berkman L. Intervention effects on safety compliance and citizenship behaviors: Evidence from the work, family, and health study. *Journal of Applied Psychology*. 2015; 10:190–208. DOI: <http://dx.doi.org/10.1037/apl0000047>.
- Hammer LB, Neal MB. Working sandwiched-generation caregivers: Prevalence, characteristics, and outcomes. *The Psychologist-Manager Journal*. 2008; 11(1):93–112.

- Hammer LB, Neal MB, Newsom JT, Brockwood KJ, Colton CL. A longitudinal study of the effects of dual-earner couples' utilization of family-friendly workplace supports on work and family outcomes. *Journal of Applied Psychology*. 2005; 90:799–810. [PubMed: 16060797]
- Hammer TH, Saksvik PØ, Nytrø K, Torvatn H, Bayazit M. Expanding the psychosocial work environment: Workplace norms and work-family conflict as correlates of stress and health. *Journal of occupational health psychology*. 2004; 9:83–91. [PubMed: 14700459]
- Hammer LB, Sauter S. Total Worker Health and work-life stress. *Journal of Occupational and Environmental Medicine*. 2013; 55:s25–s29. [PubMed: 24284759]
- Johnson, RW., Toohey, D., Weiner, J. Meeting the long-term care needs of the baby Boomers: How changing families will affect paid helpers and institutions. The Retirement Project: Discussion Paper 07–04. Washington, D.C: The Urban Institute; 2007.
- Karasek, R., Theorell, T. *Healthy Work: Stress, Productivity, and the Reconstruction of Working Life*. New York: Basic Books; 1990.
- Kelly EL, Moen P, Oakes JM, Fan W, Okechukwu C, Davis KD, ... Casper LM. Changing work and work-family conflict: Evidence from the Work, Family, and Health Network. *American Sociological Review*. 2014; 79(3):485–516. [PubMed: 25349460]
- Kelly EL, Moen P, Tranby E. Changing workplaces to reduce work-family conflict schedule control in a white-collar organization. *American Sociological Review*. 2011; 76(2):265–290. [PubMed: 21580799]
- Kessler RC, Andrews G, Colpe LJ, Hiripi E, Mroczek DK, Normand SL, Walters EE, Zaslavsky AM. Short screening scales to monitor population prevalences and trends in non-specific psychological distress. *Psychological Medicine*. 2002; 32:959–976. [PubMed: 12214795]
- Kessler RC, Barker PR, Colpe LJ, Epstein JF, Gfroerer JC, Hiripi E, ... Zaslavsky AM. Screening for serious mental illness in the general population. *Archives of General Psychiatry*. 2003; 60(2):184–189. [PubMed: 12578436]
- King, RB., Karuntzos, G., Capser, LM., Moen, P., Davis, KD., Berkman, L., ... Kossek, EE. Work-family balance issues and work-leave policies. In: Gatchel, RJ., Schultz, IZ., editors. *Handbook of occupational health and wellness*. New York, NY: Springer; 2012. p. 323-339.
- Kim N, Gordon JR. Addressing the stress of work and elder caregiving of the graying workforce: The moderating effects of financial strain on the relationship between work-caregiving conflict and psychological well-being. *Human Resource Management*. 2014; 53(5):723–747.
- Kossek EE. Diversity in child care assistance needs: Problems, preferences, and work-related outcomes. *Personnel Psychology*. 1990; 43:769–791.
- Kossek EE, Baltes BB, Matthews RA. How work-family research can finally have an impact in organizations. *Industrial and Organizational Psychology*. 2011; 4:352–369. [PubMed: 22247737]
- Kossek EE, Colquitt JA, Noe RA. Caregiving decisions, well-being, and performance: The effects of place and provider as a function of dependent type and work-family climates. *Academy of management Journal*. 2001; 44(1):29–44.
- Kossek EE, Hammer LB, Kelly EL, Moen P. Designing organizational work, family and health change initiatives. *Organizational Dynamics*. 2014; 43:53–63. [PubMed: 24683279]
- Kossek E, Pisczcek M, McAlpine K, Hammer L, Burke L. Filling the holes: Work schedulers as job crafters of employment practice in long-term health care. *Industrial and Labor Relations Review*. 2016; 69(4):961–960. DOI: 10.1177/0019793916642761 [PubMed: 27721517]
- Kossek, EE., Wipfli, B., Thompson, R., Brockwood, K. The Work, Family and Health Network intervention: Core elements and customization for diverse occupational health contexts. In: LeonEggerth, F.Chang, D.Flynn, M.Ford, K., Martinez, R., editors. *Occupational Health Disparities among Racial and Ethnic Minorities: Formulating Research Needs and Directions*. Washington, DC: American Psychological Association; 2017. p. 181-215.
- Krisor SM, Rowold J. Personal and organizational resources of family caregivers' well-being. *Personnel Review*. 2014; 43:401–418.
- Kruse RL, Alper BS, Reust C, Stevermer JJ, Shannon S, Williams RH. Intention to treat analysis: Who is in. Who is out? *Journal Family Practice*. 2002; 51:969–71.
- Lambert SJ. Added benefits: The link between work-life benefits and organizational citizenship behavior. *Academy of Management Journal*. 2000; 43:801–815.

- Landsbergis PA, Vivona-Vaughan E. Evaluation of an occupational stress intervention in a public agency. *Journal of Organizational Behavior*. 1995; 16:29–48.
- Larson RW, Richards MH, Moneta G, Holmbeck G, Duckett E. Changes in adolescents' daily interactions with their families from ages 10 to 18: Disengagement and transformation. *Developmental Psychology*. 1996; 32:744.
- Lazarus, RS., Folkman, S. Stress, appraisal, and coping. New York: Springer; 1984.
- LePine JA, Podsakoff NP, LePine MA. A meta-analytic test of the challenge stressor–hindrance stressor framework: An explanation for inconsistent relationships among stressors and performance. *Academy of Management Journal*. 2005; 48(5):764–775.
- Moen P, Kelly E, Fan W, Lee S, Almeida D, Kossek E, Buxton O. Does a flexibility/support organizational initiative improve high-tech employees' well-being? Evidence from the Work, Family, and Health Network. *American Sociological Review*. 2016; 81:134–164. DOI: 10.1177/0003122415622391
- Murray DM, Varnell SP, Blitstein JL. Design and analysis of group-randomized trials: a review of recent methodological developments. *American Journal of Public Health*. 2004; 94(3):423–432. [PubMed: 14998806]
- Murta SG, Sanderson K, Oldenburg B. Process evaluation in occupational stress management programs: A systematic review. *American Journal of Health Promotion*. 2007; 21:248–254. [PubMed: 17375490]
- National Research Corporation. 2013 National Research Report. Empowering Customer-Central Health Care for Post-Acute Providers. 2014. www.nationalresearch.com/nationalreport2013
- Neal, M., Hammer, L. Working couples caring for children and aging parents: Effects on work and well-being. Mahwah, NJ: Lawrence Erlbaum; 2007.
- Nielsen K, Randall R, Holten A, Gonzalez E. Conducting organizational level occupational health interventions: What works. *Work and Stress*. 2010; 24:234–259.
- Nixon AE, Mazzola JJ, Bauer J, Krueger JR, Spector PE. Can work make you sick? A meta-analysis of the relationships between job stressors and physical symptoms. *Work & Stress*. 2011; 25(1):1–22.
- Noblet, AJ., LaMontagne, AD. The challenges of developing, implementing, and evaluating interventions. In: Cartwright, S., Cooper, CL., editors. *The Oxford handbook of organizational well-being*. New York, NY: Oxford University Press; 2008. p. 466–496.
- Pearlin L. The life course and the stress process: Some conceptual comparisons. *Journal of Gerontology Series B. Psychological Sciences and Social Sciences*. 2010; 65B:207–215.
- Parks KM, Steelman LA. Organizational wellness programs: A meta-analysis. *Journal of Occupational Health Psychology*. 2008; 13:58–68. [PubMed: 18211169]
- Perrig-Chiello P, Hutchison S. Family caregivers of elderly persons: A differential perspective on stressors, resources, and well-being. *GeroPsych: The Journal of Gerontopsychology and Geriatric Psychiatry*. 2010; 23(4):195–206.
- Richardson KM, Rothstein HR. Effects of occupational stress management intervention programs: A meta-analysis. *Journal of occupational health psychology*. 2008; 13(1):69–93. [PubMed: 18211170]
- Semmer N. Job stress interventions and the organization of work. *Scandinavian Journal of Work Environment Health*. 2006; 32(6):515–527.
- Staufenbiel T, König CJ. A model for the effects of job insecurity on performance, turnover intention, and absenteeism. *Journal of Occupational and Organizational Psychology*. 2010; 83(1):101–117.
- ten Brummelhuis LL, Bakker AB. A resource perspective on the work–home interface: The work–home resources model. *American Psychologist*. 2012; 67(7):545–556. [PubMed: 22506688]
- ten Brummelhuis LL, Van Der Lippe T. Effective work-life balance support for various household structures. *Human Resource Management*. 2010; 49(2):173–193.
- van Woerkom M, Bakker AB, Nishii LH. Accumulative job demands and support for strength use: Fine-tuning the job demands-resources model using conservation of resources theory. *Journal of Applied Psychology*. 2016; 101(1):141–150. [PubMed: 26121090]
- Varnell SP, Murray DM, Janega JB, Blitstein JL. Design and analysis of group-randomized trials: a review of recent practices. *American Journal of Public Health*. 2004; 94(3):393–399. [PubMed: 14998802]

- Veit CT, Weir JE. The structure of psychological distress and well-being in general populations. *Journal of Consulting and Clinical Psychology*. 1983; 51:730–742. [PubMed: 6630688]
- Vermeulen M, Mustard C. Gender differences in job strain, social support at work, and psychological distress. *Journal of Occupational Health Psychology*. 2000; 5(4):428–440. [PubMed: 11051526]
- Vuori J, Toppinen-Tanner S, Mutanen P. Effects of resource-building group intervention on career management and mental health in work organizations: randomized controlled field trial. *Journal of Applied Psychology*. 2012; 97(2):273–286. [PubMed: 21942405]
- Ward-Griffin C, St-Amant O, Brown J. Compassion fatigue within double duty caregiving: Nurse Daughters caring for elderly parents. *OJIN: The Online Journal of Issues in Nursing*. 2011; 16(1)doi: 10.3912/OJIN
- Warttig SL, Forshaw MJ, South J, White AK. New, normative, English-sample data for the Short Form Perceived Stress Scale (PSS-4). *Journal of Health Psychology*. 2013; 18(12):1617–1628. DOI: 10.1177/1359105313508346 [PubMed: 24155195]
- Work, Family and Health Network. Work, Family, and Health Study (WFHS). Ann Arbor, MI: Inter-university Consortium for Political and Social Research [distributor]; 2015. Aug 12. ICPSR36158-v1<http://doi.org/10.3886/ICPSR36158.v1> Persistent URL: <http://doi.org/10.3886/ICPSR36158.v1>
- Work Family Health Network. 2017. May 15. Retrieved from www.workfamilyhealthnetwork.org

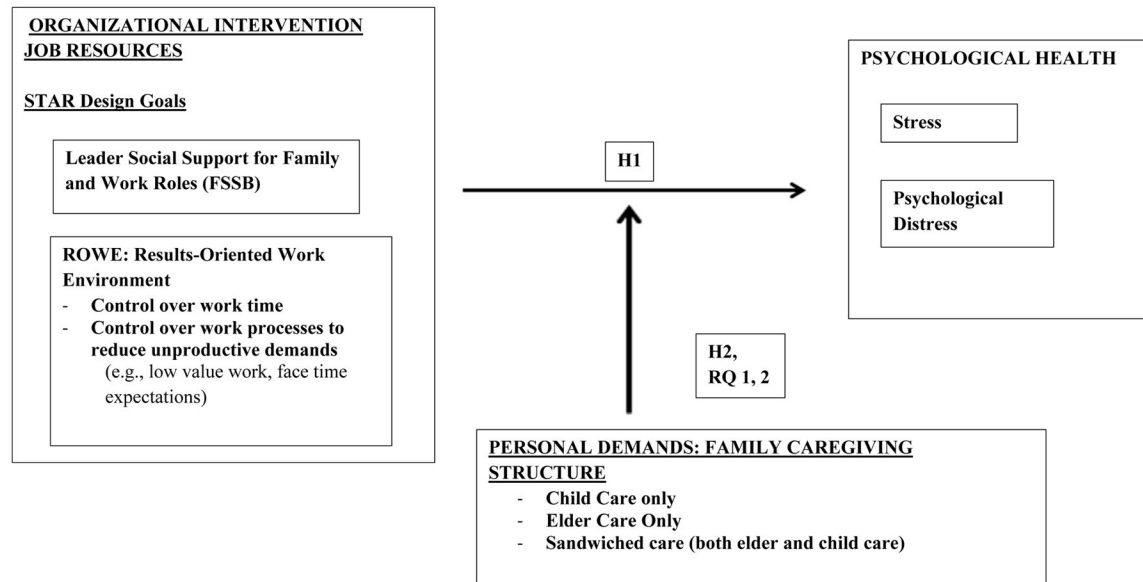


Figure 1.
Theoretical Model linking Organizational Job Resource Intervention STAR to Psychological Health Improvements with consideration of Family Caregiving Demands

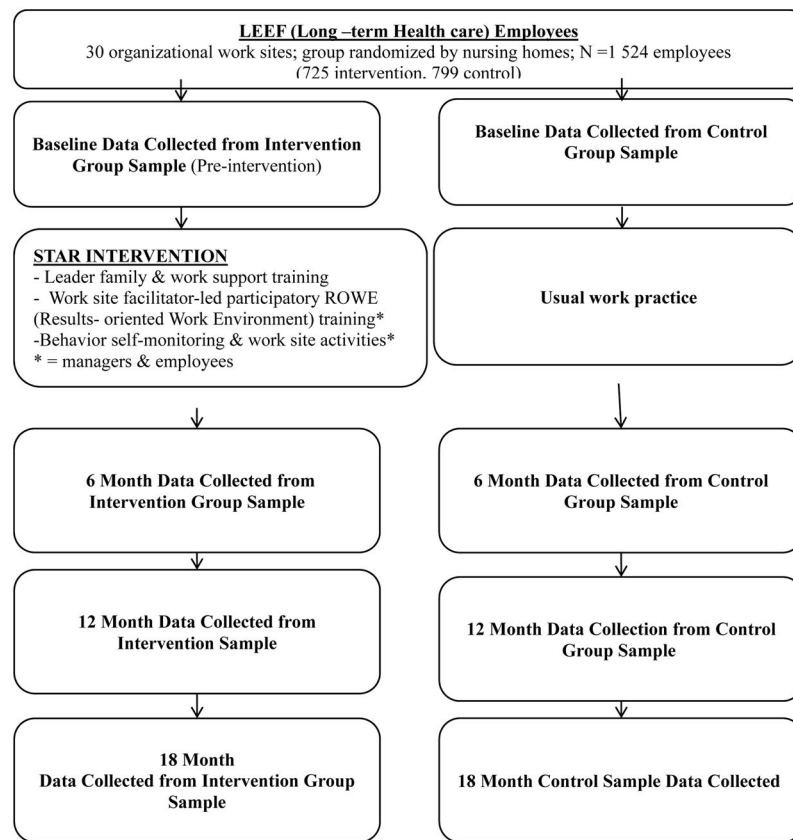


Figure 2.
Timeline of Research Design and Data Collection at Intervention and Control Sites¹.

¹Adapted from Kelly et al, (2014); Kossek et. al., (2017)

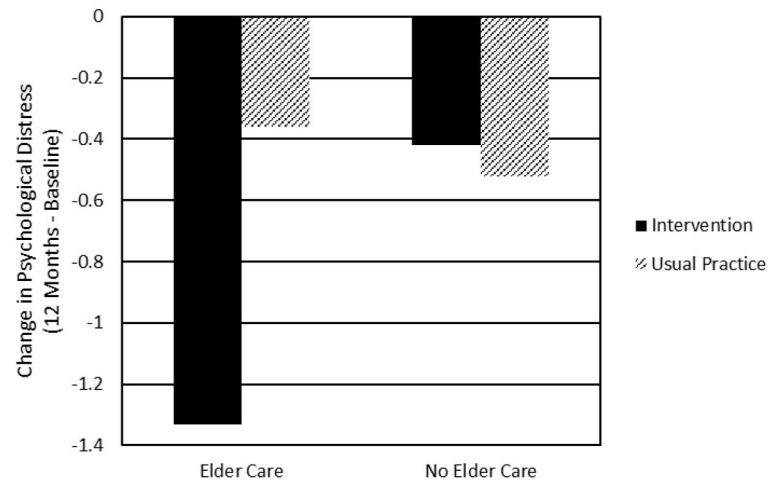


Figure 3. Illustration of the significant moderated intervention effect on psychological distress at 12 months as a function of elder care and non-elder care participants

Note. For employees with elder care responsibilities, the reduction in psychological distress from baseline to 12-months was significantly greater in the intervention locations than in the control locations. In contrast, for employees without elder care responsibilities, no significant reduction in psychological distress from baseline to 12-months was observed across intervention and control conditions.

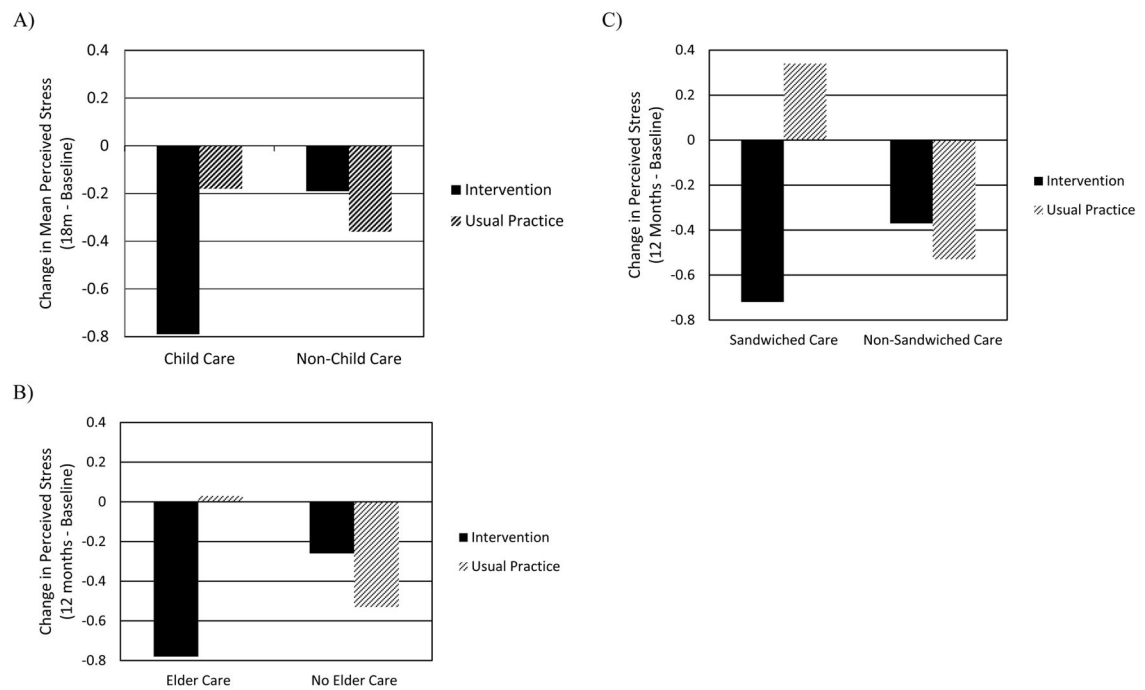


Figure 3. Moderation Intervention Effects on Perceived Stress as a Function of Baseline Care Responsibility and Post-Intervention Time Point

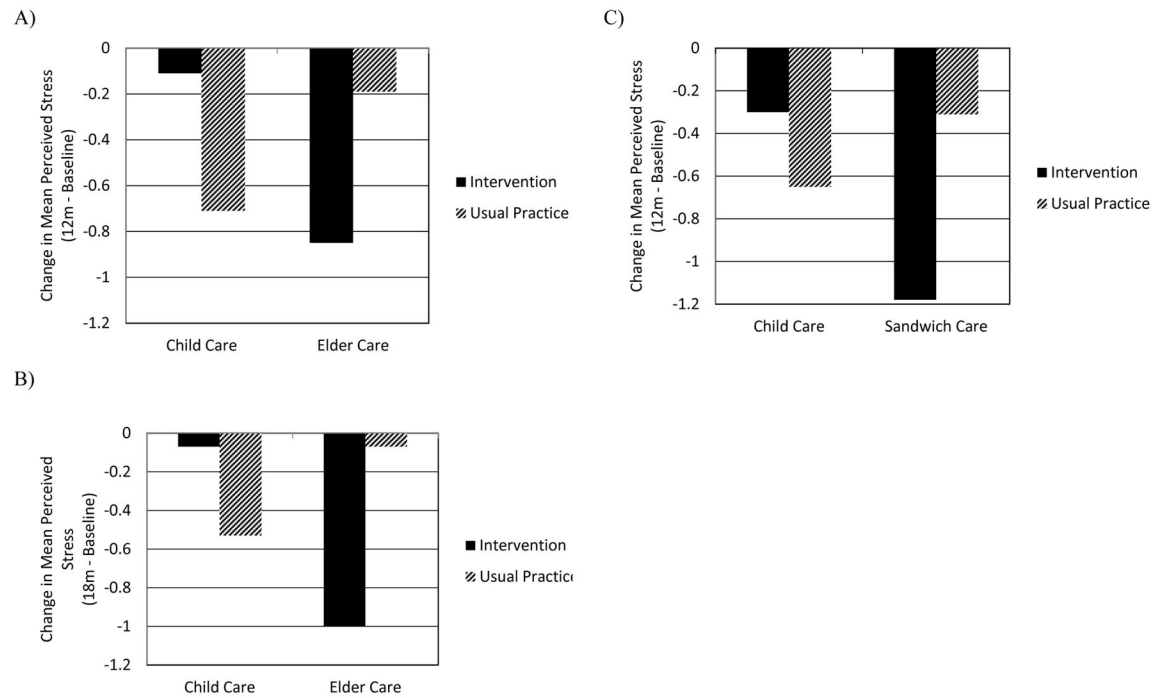


Figure 4. Moderation Intervention Effects on Perceived Stress as a Function of Baseline Care Responsibility and Post-Intervention Time Point

Table 1

Psychological Distress and Perceived Stress Means by Condition and Family Caregiving Demands Over Time

Condition	Family Caregiving Demands	Baseline	6 Months	12 Months	18 Months
Psychological Distress					
Control	Total Sample	11.76	11.21	11.24	11.14
	Child care Responsibilities	11.93	10.52	11.30	11.14
	No Child care Responsibilities	11.62	10.94	11.10	11.12
	Elder Care Responsibilities	12.28	11.70	11.92	11.61
	No Elder Care Responsibilities	11.57	11.07	11.05	11.01
	Sandwich	12.33	12.03	11.95	11.48
Intervention	Total Sample	11.68	11.12	11.10	11.13
	Child care Responsibilities	12.01	11.81	11.31	11.12
	No Child care Responsibilities	12.38	12.20	11.80	11.68
	Elder Care Responsibilities	11.71	11.49	10.88	10.61
	No Elder Care Responsibilities	12.53	12.23	11.20	11.29
	Sandwich	11.77	11.62	11.35	11.06
Perceived Stress					
Control	Total Sample	9.44	9.15	9.03	9.17
	Child care Responsibilities	9.79	9.59	9.30	9.43
	No Child care Responsibilities	9.14	8.76	8.72	8.96
	Elder Care Responsibilities	9.52	9.20	9.55	9.45
	No Elder Care Responsibilities	9.42	9.13	8.88	9.10
	Sandwich	9.57	9.39	9.91	9.40
Intervention	Total Sample	9.43	9.12	8.90	9.16
	Child care Responsibilities	9.56	9.34	9.13	9.06
	No Child care Responsibilities	9.86	9.63	9.56	9.67
	Elder Care Responsibilities	9.32	9.10	8.76	8.53
	No Elder Care Responsibilities	9.42	9.13	8.88	9.10
	Sandwich	9.57	9.39	9.91	9.40

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Condition	Family Caregiving Demands	Baseline	6 Months	12 Months	18 Months
	Elder Care Responsibilities	9.97	9.45	9.19	9.27
	No Elder Care Responsibilities	9.36	9.28	9.09	8.98
	Sandwich	10.19	9.75	9.47	9.73
	Non-Sandwich	9.45	9.27	9.08	8.95

Note. Model-implied cell means of summed scale scores reported.

Table 2
Means and Standard Deviations for and Correlations among Individual Level and Organizational Level Study Variables

Variable	Level 1 – Individual Variables												
	M	SD	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. Psychological Distress (base)	11.90	4.28	-	.60	.60	.55	.69	.51	.50	.48	.18	.10	.18
2. Psychological Distress (6m)	11.50	4.21	.57	-	.64	.61	.46	.63	.52	.49	.16	.10	.21
3. Psychological Distress (12m)	11.25	4.22	.64	.64	-	.65	.43	.52	.69	.51	.18	.16	.22
4. Psychological Distress (18m)	11.12	4.02	.61	.57	.62	-	.40	.47	.50	.67	.11	.15	.14
5. Perceived Stress (base)	9.51	3.08	.66	.45	.44	.45	-	.56	.55	.54	.13	.11	.14
6. Perceived Stress (6m)	9.25	2.93	.47	.69	.50	.47	.56	-	.62	.59	.07	.12	.11
7. Perceived Stress (12m)	9.06	2.94	.48	.54	.70	.52	.52	.64	-	.63	.10	.16	.12
8. Perceived Stress (18m)	9.13	2.96	.48	.43	.48	.69	.54	.52	.58	-	.06	.22	.13
9. Elder care	.30	.46	.13	.12	.13	.11	.04	.06	.06	.05	-	.02	.61
10. Child care	.47	.50	.05	.10	.06	.06	.13	.16	.12	.13	-.05	-	.46
11. Sandwiched Care	.14	.34	.08	.11	.10	.05	.04	.11	.09	.03	.60	.39	-

Notes: Correlations for the control group shown below the diagonal. Correlations for the intervention group shown above the diagonal. Ns for control condition range from 552 to 723; Ns for intervention condition range from 454 to 721. Baseline (base), 6-month (6m), 12-month (12m), and 18-month (18m) measurement occasions. Elder care (458 = has elder care responsibilities; 1066 = otherwise); child care (712 = has child care responsibilities; 811 = otherwise); sandwiched care (208 = has child and elder care responsibilities; 1315 = otherwise).

Table 3

Mixed Model Results of Intervention Effects on Psychological Distress, Overall and with Family Structure Moderator Variables

Outcome: Psychological Distress	Intervention Effect on Psychological Distress			Moderator Variable		
	EST/SE	Elder care	Child care	Sandwiched Care		
Intercept	12.01 (.20)*	12.53 (.26)*	12.38 (.25)*	12.54 (.35)*		
6-Month Wave (6m)	-.20 (.15)	-.30 (.28)	-.18 (.22)	-.05 (.41)		
12-Month Wave (12m)	-.70 (.16)*	-1.33 (.31)*	-.58 (.24)*	-1.13 (.46)*		
18-Month Wave (18m)	-.89 (.17)*	-1.24 (.32)*	-.70 (.24)*	-.87 (.45) ^t		
Control Group (Control)	-.25 (.27)	-.25 (.37)	-.45 (.34)	-.21 (.50)		
Moderator	-	-.76 (.26)*	-.67 (.29)*	-.63 (.34) ^t		
6m*Control	-.35 (.20)^t	-.28 (.41)	-.23 (.30)	-.25 (.61)		
12m*Control	.18 (.22)	.97 (.45)*	-.05 (.32)	.75 (.67)		
18m*Control (6, 12, and 18 Month Effects)	.27 (.22)	.57 (.46)	-.09 (.33)	.02 (.68)		
Control*Moderator	-	.05 (.36)	.36 (.40)	-.02 (.49)		
6m*Moderator	-	.15 (.35)	-.04 (.31)	-.17 (.45)		
12m*Moderator	-	.91 (.38)	-.25 (.33)	.50 (.50)		
18m*Moderator	-	.53 (.39)	-.40 (.34)	-.03 (.49)		
6m*Control*Moderator	-	-.07 (.49)	-.23 (.42)	-.09 (.66)		
12m*Control*Moderator	-	-1.07 (.53)*	.36 (.45)	-.70 (.72)		
18m*Control*Moderator(6, 12, and 18 Month Moderated Effects)	-	-.42 (.54)	.69 (.46)	.33 (.73)		

Note. EST stands for estimated unstandardized parameter and SE stands for Standard Error. For the intervention effects model, the reference group is the intervention group at baseline. For the elder care/child care/sandwiched care/moderation models, the reference group is the intervention group with elder care/child care/sandwiched care at baseline. Intervention effects and moderated intervention effects in boldface. Sample sizes for each level of the moderators at baseline are elder care (n = 456), Non-elder care (n = 1064); Child care (n = 709), Non-child care (n = 810); Sandwiched care (n = 207), Non-sandwiched care (n = 1312); Married/cohabiting (n = 956), Single (n = 564).

* = p. sig. < .05.

^t = p. sig. < .10

Table 4

Mixed Model Results of Intervention Effects on Perceived Stress, Overall and with Family Structure Moderator Variables

Outcome: Employee perceived stress	Moderator Variable			
	Intervention Effects on Perceived stress		Elder care Child care Sandwiched care	
	EST/SE	EST/SE	EST/SE	EST/SE
Intercept	9.56 (.14) [*]	9.97 (.19) [*]	9.86 (.17) [*]	10.19 (.25) [*]
6-Month Wave (6m)	-.22 (.11) [*]	-.52 (.21) [*]	-.23 (.17)	-.44 (.31)
12-Month Wave (12m)	-.43 (.12) [*]	-.78 (.23) [*]	-.30 (.18) ^t	-.72 (.34) [*]
18-Month Wave (18m)	-.50 (.12) [*]	-.70 (.24) [*]	-.19 (.18)	-.46 (.33)
Control Group (Control)	-.12 (.19)	-.45 (.27) ^t	-.07 (.24)	-.62 (.36) ^t
Moderator	-	-.61 (.19) [*]	-.54 (.21) [*]	-.74 (.25) [*]
6m[*]Control	-.07 (.15)	.20 (.30)	.03 (.23)	.26 (.45)
12m[*]Control	.02 (.16)	.81 (.33)[*]	-.19 (.24)	1.06 (.49)[*]
18m[*]Control (6, 12, and 18 Month Effects)	.23 (.17)	.63 (.34)^t	-.17 (.24)	.29 (.50)
Control [*] Moderator	-	.51 (.27) ^t	-.11 (.28)	.60 (.36)
6m [*] Moderator	-	.44 (.26)	.01 (.23)	.26 (.33)
12m [*] Moderator	-	.51 (.28)	-.26 (.24)	.35 (.37)
18m [*] Moderator	-	.32 (.29)	-.60 (.25) [*]	-.04 (.36)
6m[*]Control[*]Moderator	-	-.41 (.36)	-.19 (.31)	-.39 (.49)
12m[*]Control[*]Moderator	-	-1.08 (.39)[*]	.33 (.33)	-1.22 (.53)[*]
18m[*]Control[*]Moderator (6, 12, and 18 Month Moderated Effects)	-	-.57 (.40)	.78 (.34)[*]	-.06 (.54)

Note. EST stands for estimated unstandardized parameter and SE stands for Standard Error. For the intervention effects model, the reference group is the intervention group at baseline. For the elder care/child care/sandwiched care/moderation models, the reference group is the intervention group with elder care/child care/sandwiched care at baseline. Intervention effects and moderated intervention effects in boldface. Sample sizes for each level of the moderators at baseline are elder care (n = 457), Non-elder care (n = 711), Non-child care (n = 809), Sandwiched care (n = 208), Non-sandwiched care (n = 1312);

^{*} = p. sig. < .05.

^t = p. sig. < .10